PHENIX AEROGEL DETECTOR OPERATIONS IN THE PEH

procedure name

PHENIX Procedure No. PP-2.5.2.8-05

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_____ PHENIX /Safety Date

_____ CA-D SAFETY Date

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1.0 Purpose

The purpose of this document is to define the plan for operation of the PHENIX Run-4 (2003-2004) Aerogel Cherenkov Counter (AEROGEL) in the PEH (PHENIX Experimental Hall). This plan will ensure:

1.1 the safety of all personnel from risk associated with the operation of the high voltage system required for powering the AEROGEL,
1.2 prompt notification of the appropriate CA-D and ES&H specialist,
1.3 the maintenance of appropriate CA-D emergency status,
1.4 the preservation and protection of the environment, and
1.5 the preservation of BNL facilities and equipment.

2.0 Responsibilities

During the Run-4, there are two phases for operation of the AEROGEL. One is data taking phase, and the other is an AEROGEL commissioning phase prior to the data taking, when the AEROGEL is tested with high voltage before the IR is closed and the AEROGEL is inaccessible.

2.1 During commissioning phase.

The AEROGEL -HV & -LV systems will be monitored by the team of AEROGEL Experts. The AEROGEL Experts are described in Section 6.1. The AEROGEL Experts will keep a record of the performance of the AEROGEL.

2.2 During data taking phase,
There will be two levels of responsibilities for the oversight of the AEROGEL.

2.2.1 The first level of responsibility will be the PHENIX Shift Crew. It is the responsibility of the PHENIX Shift Crew to:

2.2.1.1 monitor the status and alarms for the AEROGEL HV system, LV system and nitrogen ventilating system according to a prescribed check off list at least once a shift (eight hours).
2.2.1.2 in event of an alarm or irregularity, contact a member from the Call List given in Appendix A.

2.2.2 The second level of responsibility is the AEROGEL Experts. It is the responsibility of the AEROGEL Experts to maintain the AEROGEL in a safe operating condition. This includes:

2.2.2.1 setting, adjusting, and checking the HV and LV power supplies,
2.2.2.2 turning on the ventilating system,
2.2.2.3 posting any special instructions or notifications as required, and
2.2.2.4 carrying out any emergency actions, as prescribed in the Procedures section of this document.

3.0 Prerequisites

The AEROGEL experts shall have read or have training in the following areas:

3.1 Local Emergency Plan for the C-A Department, C-AD OPM 3.0,
3.2 BNL Electrical Safety I,
3.3 CA-D USER training, PHENIX IR Access training
3.4 geographical layout of the experimental area (routes of egress, location of emergency equipment, phones and controls) C-AD OPM 3.16

The AEROGEL Experts shall train all personal involved in the AEROGEL running in the safe operation of the AEROGEL HV & LV systems.

4.0 Precautions

4.1 HV system precautions

The HV power supplies are current limited at less than 2.5 milliamp per channel. All HV points are enclosed within the insulation cover along the cable in order to eliminate the danger to personnel.

4.2 LV system precautions

There are two kinds of LV for the AEROGEL. One (LVHP, type "S") is for FEM crate, the other (LVLP, type "Z2") is for the preamplifiers. The two low voltage power supplies are located in the same LV crate in WCN-22 rack. Because the voltage is low, LV wires may stay energized while AEROGEL FEM Testing. Electrical safety-I is mandatory.

4.3 Nitrogen ventilating system precautions

The Nitrogen ventilating system is for keeping clean inside the cells of AEROGEL. In advance to the operation, every column (containing 10 boxes) of the gas needs to be equalized to each other to have a common control of gas flow. Then apply the appropriate pressure and volume of the gas in order to have positive pressure in the Al-Box with respect to ambient pressure. In the normal operation, the system should be always turned on. The status of the gas flow system is shown in the ADAM control panel. If the pressure of the output of the Al-Box is not positive, then AEROGEL experts or the properly trained personal for that increases the input rate then keep the record of the increase. If improvement is not seen, call the AEROGEL expert. If the system is off, call AEROGEL experts as described in Section 6.1.

4.4 LED Calibration system precautions

The LED is driven by following stream.

4.4.1 The first is a "trigger pulse generator" (which is controlled by the PPG), which provides the input of two "LED drivers".

4.4.2 Each of the LED drivers generates 8 outputs, which drive the LED emission. Each of the output is connected to a channel of a "LED divider".

4.4.3 This is about ***equipments (PMTs) safety***. The LED divider has 8 channels, and each channel has two outputs. *WHEN THE OUTPUT CABLES ARE DISCONNECTED, THE TWO OUTPUTS ON SINGLE CHANNEL NEED TO BE DISCONNECTED AT THE SAME TIME.* ***Practically, you have to turn off the NIM crate on which the LED driver is stationed.*** *The luminosity of the LED is very much sensitive to the impedance of the output cables. IF only one of two output cables is disconnected, LED provides too much light to the PMTs, and the situation is* ***an equipments (PMTs) danger****.*

5.0 Standard Operating Procedures

5.1 HV system Procedure: Turning on high voltage to the AEROGEL

5.1.1 Check that the appropriate current limits are in place for each channel of each HV module, and check that the appropriate HV limits are in place for each channel. The AEROGEL Experts and personnel assigned to operate the AEROGEL HV shall maintain a HV logbook where the operating parameters of the HV setting are recorded.

5.1.2 Check that the ramp-up rate for each channel is appropriate (< 500 volts per step).

5.1.3 Start ramping up HV and place the "HV ON" sign in a prominent position.

5.1.4 If any of the HV supplies trips, disable all channels in the same modules until the reason for the trip is understood and call AEROGEL members listed in Appendix A. If the reason for the trip is understood, then begin the procedure again from 5.1.1.

5.1.5 If there are no HV trips, verify that the operating currents are appropriate.

5.1.6 When ramping is complete, verify that the operating current and voltage for each channel are appropriate, as given in the operating log.

5.1.7 Check the appropriate AEROGEL HV and LV temperatures.

5.1.8 HV is ready for AEROGEL.

5.2 HV System Procedures: Turning off high voltage to the AEROGEL

5.2.1 Begin ramping down the HV (<500 volts per step).

5.2.2 Verify by the read back that the HV is off in the system.

5.2.3 Remove the "HV ON" sign.

6.0 Documentation

6.1 AEROGEL Expert list with calling number (Appendix-A)

7.0 Reference

*7.1 BNL" **SBMS"***

7.2 C-AD OPM 3.16, "Emergency Procedure for the PHENIX Detector Building 1008 Comp

Appendix-A

AEROGEL Expert and the calling number

1. Masahiro KONNO x-6254
2. Shingo SAKAI x-6254
3. Yoshihiko NAGATA x-6254
4. Satoshi TAKAGI x-6254
5. Maya SHIMOMURA x-6254
6. Hiroshi MASUI x-6254
7. Masanori NARISAWA x-6254
8. Takayuki KAWAGISHI x-6254
9. Tomoyasu SHOUJOU x-6254
10. Anatory LITVINENKO x-6254
11. Serguei AFANAS'EV x-6254
12. Kyoichiro OZAWA x-4015
13. Takao SAKAGUCHI x-4999
14. Narumi KURIHARA x-2679
15. Susumu SATO x-5152
16. Edouard KISTENEV x-7502